

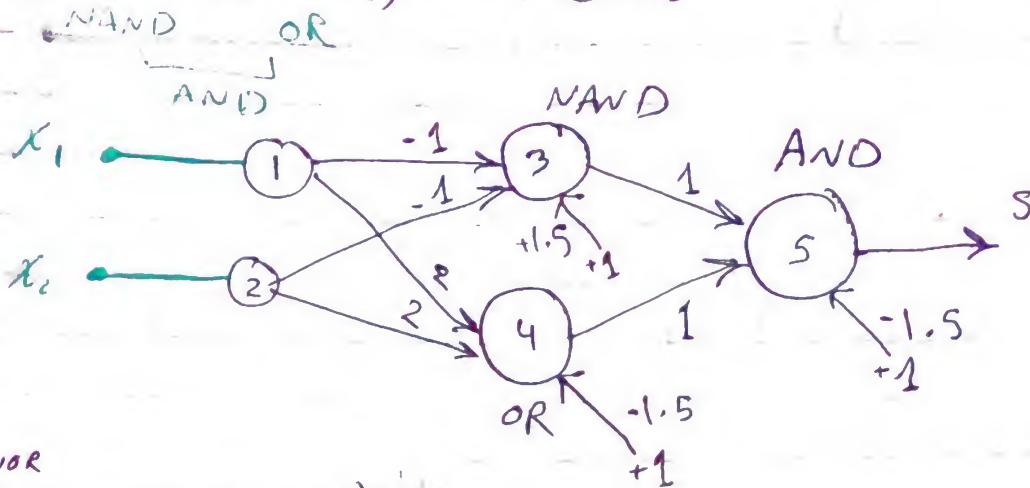
8/10/2016

بیت

م. محمد

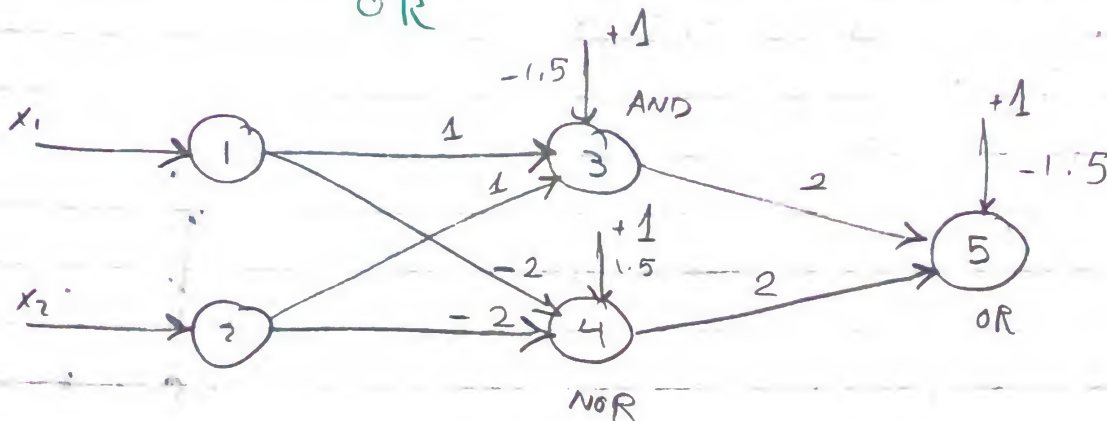
فصل 2

16 $(x_1 x_2)' (x_1 + x_2) = x_1 \oplus x_2$



$x_{NOR} x_1 \odot x_2 = x_1 x_2 + x_1' x_2'$

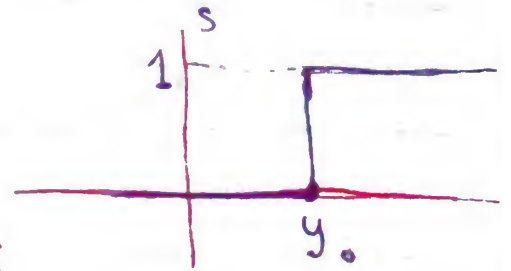
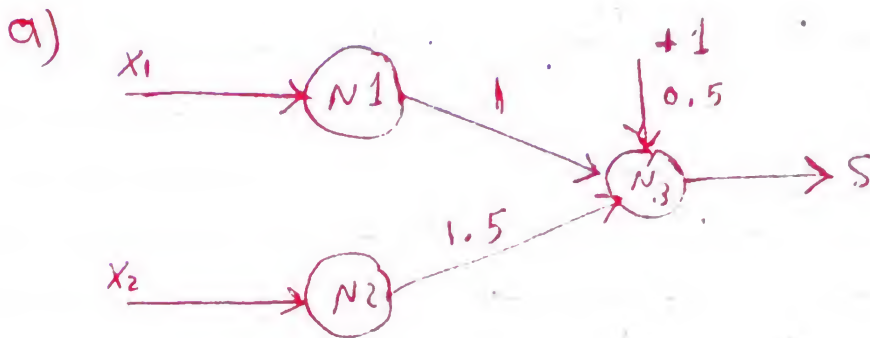
$= x_1 x_2 + (x_1 + x_2)'$
 AND NOR
 OR



الحد يكون بالخطوات مفصلة، راجع سلك 1 و محاضرة 2 للخطوات



* Shifted threshold :-



Using shifted binary threshold, satisfy
OR operation:-

$$y = x_1 + 1.5x_2 + 0.5$$

① $x_1 = x_2 = 0 \longrightarrow S = 0$
 $y = 0.5$ ①

② $x_1 = 1, x_2 = 0 \longrightarrow S = 1$
 $1 + 0.5 = y \Rightarrow y = 1.5$ ②

③ $x_1 = 0, x_2 = 1 \longrightarrow S = 1$
 $1.5 + 0.5 = y \Rightarrow y = 2$ ③

④ $x_1 = x_2 = 1$
 $1.5 + 1 + 0.5 = y \Rightarrow y = 2.5$ ④

x_2	x_1	S
0	0	0
0	1	1
1	0	1
1	1	1

$$0.5 < y_0 < 1.5$$

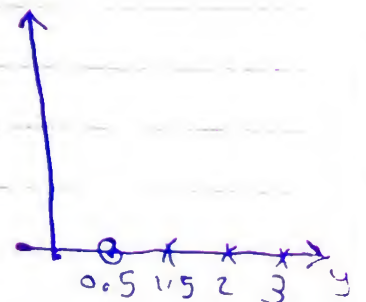
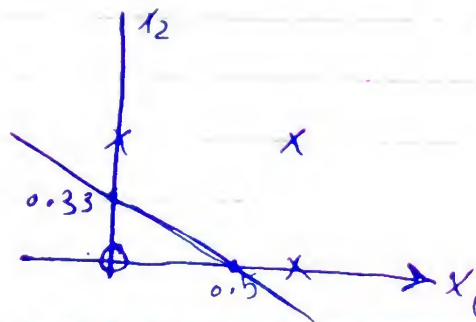
$$y_0 = 1 \text{ (arbitrary)}$$

$$y = x_1 + 1.5x_2 + 0.5$$

$$1 = x_1 + 1.5x_2 + 0.5$$

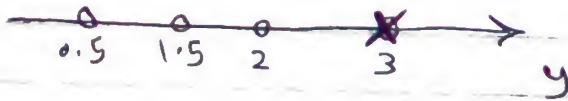
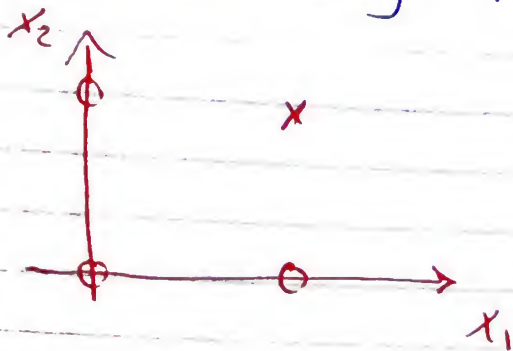
$$x_1 = 0 \Rightarrow x_2 = 0.33$$

$$x_2 = 0 \Rightarrow x_1 = 0.5$$



For AND; Follow the same steps with the following TT

x_2	x_1	S
0	0	0
0	1	0
1	0	0
1	1	1



$$2 < y_0 < 3$$

$$\text{Let } y_0 = 2.5$$

$$2.5 = x_1 + 1.5x_2 + 0.5$$

$$x_1 = 0 \rightarrow x_2 = 1.33$$

$$x_2 = 0 \rightarrow x_1 = 2$$

